Energy Performance Systems, Inc.

Project Title: **"Improving the Efficiency of Planting, Tending and Harvesting Farm-Grown Trees for Energy"**

Contract Number: RD-50 Milestone: Number 1 Report Date: 4/14/2006

Reporting Period: 1/16/06-4/16/06

Principal Investigator: L. David Ostlie, President, Energy Performance Systems, 763-428-0646

Congressional District: 4 (Corporate Office and Prototype Fabrication Laboratory; Rodgers, MN)
Congressional District: 7 (Farm Location; Glencoe, MN)
Congressional District: 6 (Harvester Fabrication Location; Big Lake, MN)

MILESTONE 1 – SUMMARY REPORT (PUBLIC)
ANNUAL LAND RENT

Executive Summary: The 80 acres of land needed for the first planting of hybrid poplars trees was leased on March 16, 2005 for 5 years. The land rented meets all desired criteria except for price. The Xcel contract calls for the first 80 acres of land to be leased for five years with payments made annually. In order to obtain suitable land for the project it was necessary to sign a five-year lease paid up in full at the start of the lease. The lease for 80 acres of farmland near Glencoe, MN, was signed by the Glencoe county farmer and Energy Performance Systems (EPS) on March 16, 2006 for a five year period. The higher than expected cost of farmland rental was due to multiple reasons. Farm land prices nationwide increased by 11% in 2004, the highest gain since 1981, and the trend continued in 2005. Strength in land values is due to low interest rates, record-high net cash farm income (related to federal price support programs), high crop yields in 2004 & 2005, anticipated high demand for corn for ethanol production and export in 2006, and expansion of urban areas onto cropland areas. Paying for 5 years rent up-front was the only way to obtain a fixed land rental cost during the life of the project on land meeting our criteria. Obtaining land that has the potential of supporting high growth rates of hybrid poplars is the most important activity of this project with respect to reaching the yield goals of this project. Consequently it was necessary to go above and beyond the anticipated level of effort necessary in order to obtain the desired land type.

Technical Progress:

Land Selection Criteria

To assure growth conditions conducive to high yield of hybrid poplar trees the project required land with the following characteristics:

1) average rainfall above 27 inches
2) at least 160 growing days

3) deep, high organic content (dark) soils,
4) a PH between 6.0 and 7.8
5) tillable land with prior history of row cropping (thus requiring cropland)
6) soil with good water holding capacity and/or relatively high water table

Economic/risk considerations (for EPS) included the following requirements:
1) poor or no drain tile
2) a crop equivalency rating of about 75 or higher
3) less than 2% slope
4) plot size of approximately 80 acres
5) located within reasonable driving distance of Rodgers, MN
6) rental rate of $100/acre or less

Land Selection Process

The search for land began in mid-August 2005, after contract negotiations with Xcel were nearing finalization. Visits were made to the court houses of Blue Earth, Waseca, and Steele counties to obtain local maps and plat books. Contact was made by phone or in person with USDA staff in Farm Service Agency or Natural Resource Conservation District Offices to obtain general recommendations and information on Crop Equivalency Ratings, extent of drain tilling on farmland, and to obtain soils maps.

Contact was also made in August 2005 with a reality firm that specializes in cropland in Southern Minnesota. EPS requested that the reality firm submit a draft proposal to EPS for identifying qualifying cropland available for rent. They appeared interested, but did not follow through with a proposal. Comments made by the reality agents during discussions suggested why they may have been hesitant to become involved given the site requirements of EPS. They indicated that getting farmers to agree to rent their land might be difficult because: (1) most good cropland is tiled, and (2) renting cropland for 5 years for tree plantations may affect their "corn base" (thus reducing potential for payment from USDA price support programs). The realitors predicted the consequence would be that farmers would want a higher than normal rental payment to be interested in tying up cropland in trees for 5 years. The realtors noted that a lot of recent farmland sales in southern Minnesota had netted between $3000 and $4000 per acre (50 to 100% higher than recent average values) and cropland rental rents were following suit.

In September 2005, EPS hired a GIS expert, Ken Pekerek, to use existing databases in combination with the expert opinions of EPS project team members, to locate optimal cropland areas that would meet our criteria. Using the selection criteria described above, a series of sequential screens were applied to relevant data sets to identify appropriate land. Appendix figure 1 shows areas of tillable land that met rainfall, soils, temperature, slope, and water holding capacity criteria. This process helped in understanding the scope of the land resource that could meet our growth criteria (a lot of land). The more important information was learning what locations in the state did not meet our criteria. The GIS programs were also installed on the computers of EPS project team members so that additional analysis could be performed as needed.

A “ground truth” tour was made, before the corn crop harvest began in late September, to gain additional information on cropland and crop yield status. The focus was on identifying land meeting the stated technical criteria but located in areas where land rents were historically lower. This included Wright county, Le Sueur County, and Watonwan county. Photo’s and soil samples were taken and detailed maps obtained where available.

Discussions were also held by an EPS project member with the University of Minnesota Extension Economist, Steve Taft, who annually produces a report on cropland rental rates. His recommendation was that cropland rental rates of $100 or less would likely only be found in central or western Minnesota. He advised us that because hybrid poplars are a new crop, farmers may want special consideration for using their land. For instance, they may want multi-year contracts, escrow, penalty provisions, and they may be very concerned about what the land will look like when our project is completed.

The first discussions held with a farmer on renting the land, was a farmer in Nicollet County who was interested in the project because he had already grown 5 acres of hybrid trees (very successfully) on his property. He initially offered to rent about 50 acres for $160/acre in mid-September 2005. EPS did not act on this because: (1) the land area was too small, (2) the land rental price was higher than $100/acre, and (3) because the contract with Xcel was not yet approved. EPS delayed making any other direct contacts with farmers until it was certain that the contract with Xcel was approved.

Once the contract with Xcel was finalized in mid-October, the next step made in identifying farmers willing to rent their land for our project was to contact Farm Service Agencies in 12 central and south central Minnesota counties and request that they post “Land Wanted” ads in their offices or otherwise share this information with farmers. Most indicated they felt it was inappropriate, though some agreed to help. Land Wanted ads were also sent to the organizers of the Minnesota Farm Bureau and National Farmers Union Meetings held in Minnesota in late November. Daily newspapers in South Central Minnesota were checked for possible farm ads as were many web sites associated with farm news in Minnesota. A “Land Wanted” ad was placed on the Minnesota Farm Guide website. No responses were received within 2-3 weeks.

The approach which resulted in success was the placing of a radio announcement on the Linder Farm Network for 4 weeks in late December and early January. Roughly 30 responses were received. All of the responders were offering land that was too costly ($200/acre or more), or had drain tile, or was too distant. After reviewing all responses, it was decided to re-contact some interested farmers with land that met most criteria, other than price; plus EPS also re-contacted the Nicollet County farmer. By early February, the Nicollet County farmer had increased his land rental price. He based this on projected crop demand, crop yield expectations, and estimates of what he could obtain from government crop price support programs. Based on his assumptions that a similar situation would occur in 2006 and future years, he felt justified in asking for a high rental price and a 5-year contract. At the second site near Glencoe, MN (McLeod County), the farmer initially wanted over a high rental rate. In order to obtain a lease the farmer required that the five-year lease be paid in full at the start

of the lease. Given that the 2005 land value statistics for McLeod county show most cropland selling at $2300 to $4500/acre (Appendix table 1), indicating that land values in that county are trending above average, it was decided to accept this condition. The 5-year lease was signed by the Glencoe county farmer and EPS on March 16, 2006. According to associated information, the soil types of the leased land are among the best in McLeod county (Appendix table 2)

Discussion on Land prices

How could EPS have so underestimated the land rental rate in the proposal? The proposed rate was based on recent previous interactions of EPS with farmers in several parts of Minnesota while trying to develop a tree to energy project and 2004 data published by the University of Minnesota in September 2005 where the average 2004 rental rates in central and south Minnesota were still in the range of $70 to $117/acre (Appendix table 3). An analysis of farmland sales by Steve Taft, extension economist at the University of Minnesota shows (Appendix figures 2a, 2b) shows that most farm real estate prices in South Central Minnesota, one of our target areas, were still averaging around $2000 per acre in 2002 and 2003. An analysis of 2002 and 2003 cropland sales values versus productivity based on crop equivalency ratings, (Appendix figures 3a, 3b) shows the relationship between sales price and productivity was beginning to breakdown, but was holding relatively strong with high productivity land still being available for about $2000/acre. It was our assumption that land in this value range would rent for around $100/acre. This was the most recent information available prior to preparing our proposal.

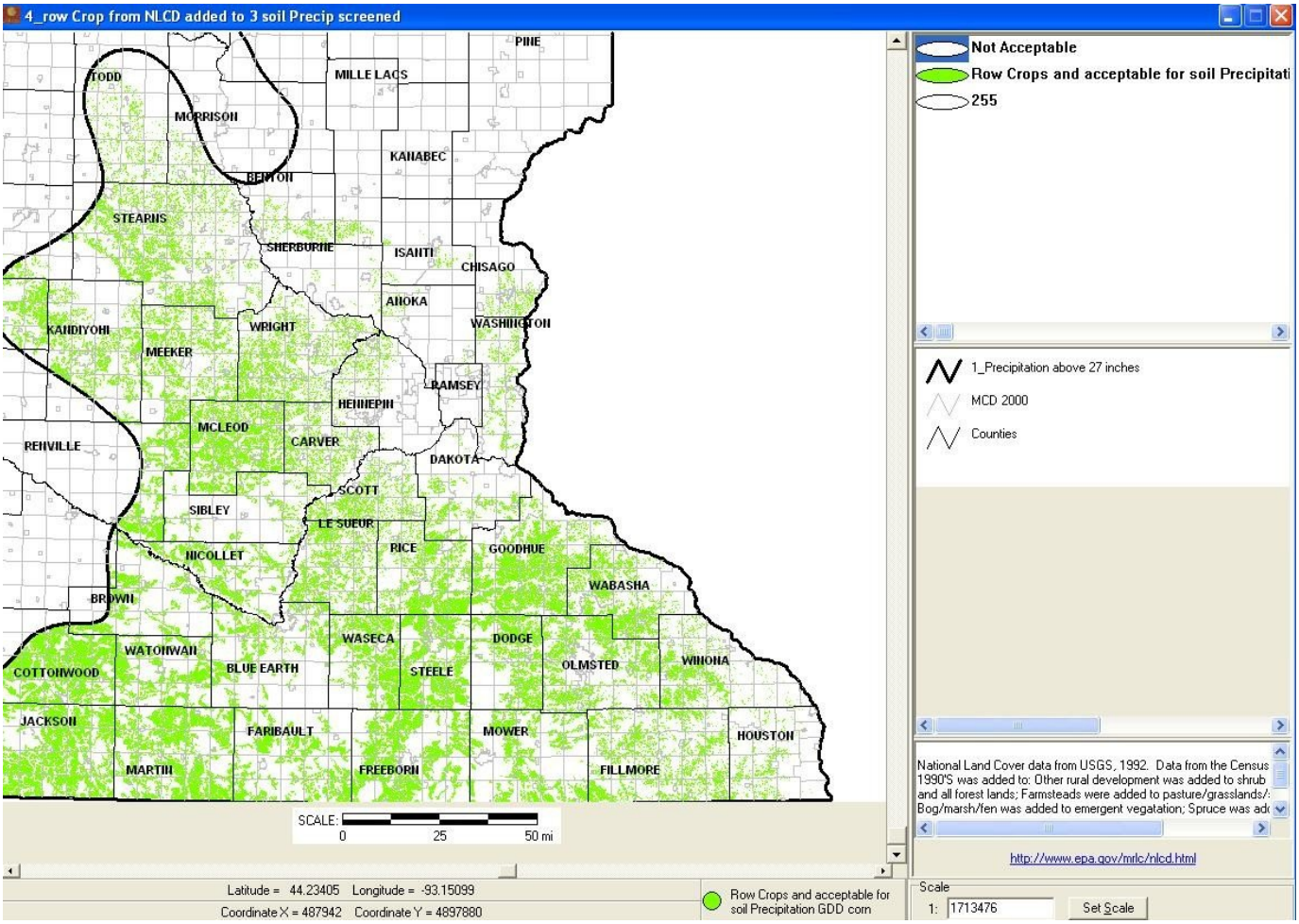
The fact that cropland rental rates accelerated in the 2004 and 2005 time period was noted by the Doanes Agricultural Report in an article dated August 12, 2005. They reported that the national average gain in price per acre of 11% between 2004 and 2005 was the highest percentage gain since 1981. Some states had even higher gains, such as Iowa that had a 14.2% gain. This level of gain is probably most representative of what was happening in the southern corn belt of Minnesota. In the southeastern states where much of the farmland was being sold for non-agricultural uses, the increase was 11 to 22% with the average value being about $6000/acre. The same thing was happening in counties just south of Hennipen county in Minnesota. The report noted that farmers in Iowa and Illinois were renting cropland for $180 to $200/acre – a number we also found to be true in southern Minnesota. The article explained that high sales values and rental rates reflected the optimism of producers following a combination of two years of high crop yields, and price levels of major U.S. commodities. An additional factor affecting cropland values was low interest rates (meaning a farmer could earn more by selling land than with any other financial vehicle). This fact was observed by the Wingert Realty folks. Another factor mentioned in the article was the continuing impact of the “1031 tax exchange provisions in the tax code”. Given this situation, we now feel extremely fortunate to have found a farmer willing to rent us highly productive land in central Minnesota for 5 years. It may be necessary for this project to consider somewhat less productive land when selecting the next 80 acres for our trials.

Progress Payment 1

A progress payment from Xcel of $8550 is requested at this time. EPS's costs to date have included the up-front 5-year land rental payment (as explained above), $3000 for GIS analysis, $2500 for the radio announcements plus additional subcontractor and EPS labor costs involved in identifying and negotiating for the land.

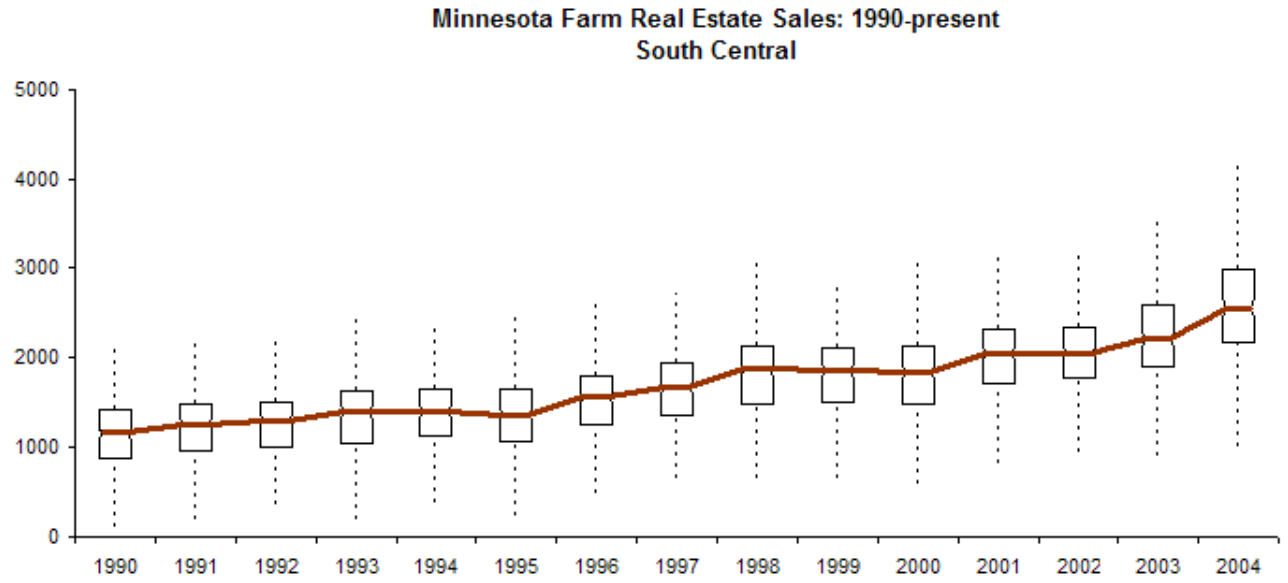
Appendix:

Figure 1: GIS map showing MN land meeting criteria



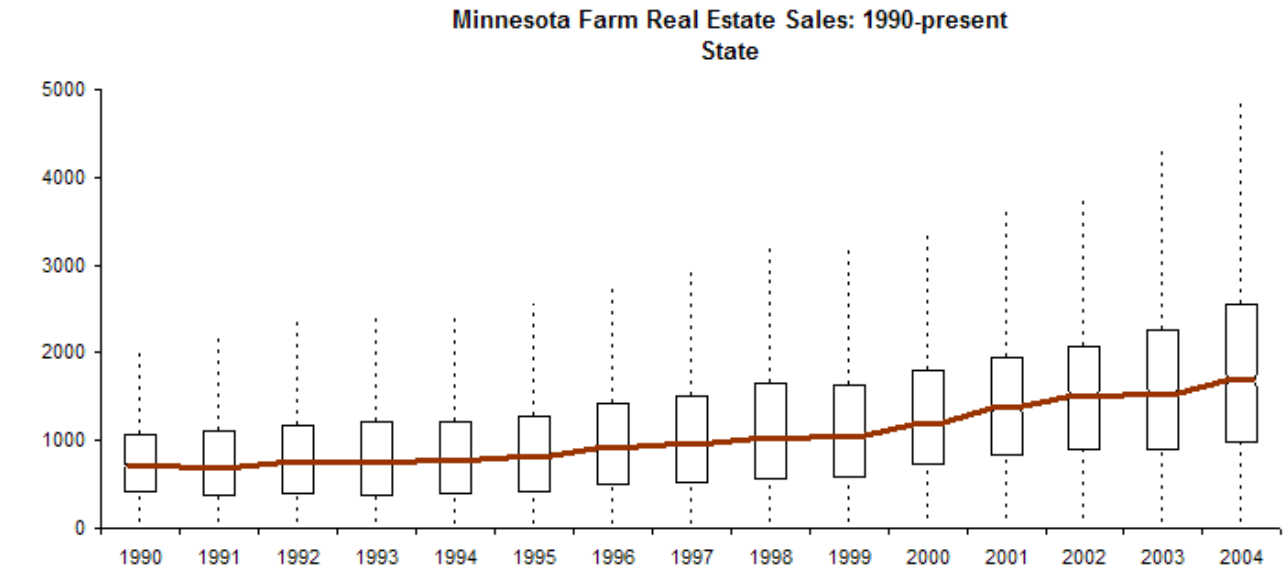
Source: analysis performed by Ken Pekerek for EPS.

Figure 2a: Minnesota Farm Real Estate Sales: 1990-present, South Central



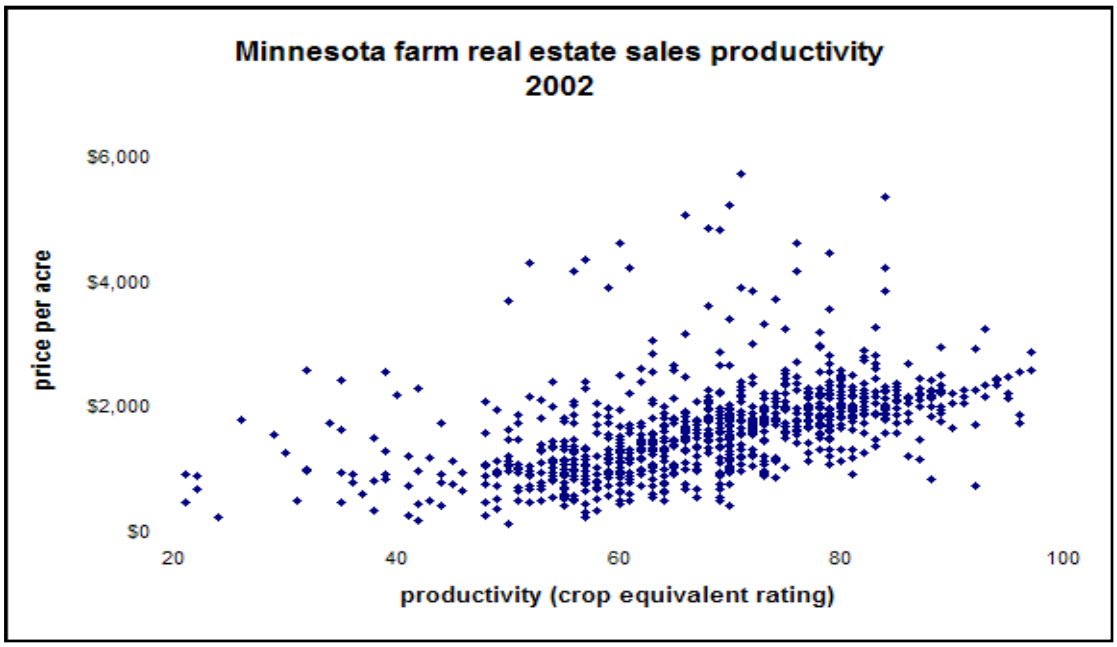
Source: Steven Taff, 2005. Minnesota Farm Real Estate Sales: 1990-2004
http://www.cffm.umn.edu/landeconomics/landdata/FarmLandSale/Default.htm

Figure 2b: Minnesota Farm Real Estate Sales: 1990-present, State



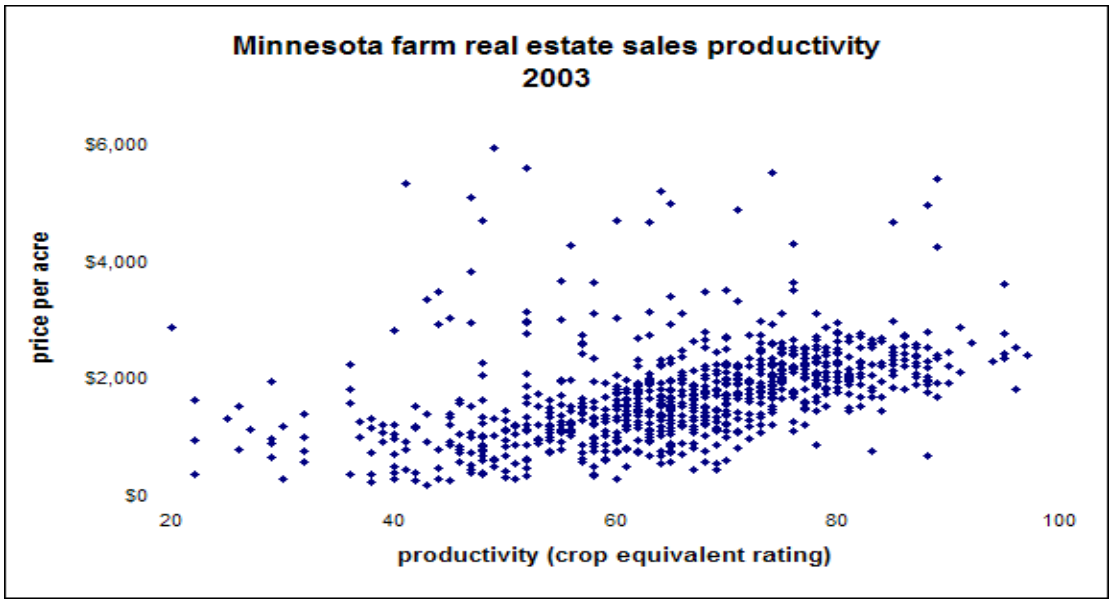
Source: Steven Taff, 2005. Minnesota Farm Real Estate Sales: 1990-2004
http://www.cffm.umn.edu/landeconomics/landdata/FarmLandSale/Default.htm

Figure 3a: Minnesota farm real estate sales productivity – 2002



Source: Steven Taff, 2005. Minnesota Farm Real Estate Sales: 1990-2004
http://www.cffm.umn.edu/landeconomics/landdata/FarmLandSale/Default.htm

Figure 3b: Minnesota farm real estate sales productivity – 2003



Source: Steven Taff, 2005. Minnesota Farm Real Estate Sales: 1990-2004
http://www.cffm.umn.edu/landeconomics/landdata/FarmLandSale/Default.htm

Table 1. Land Value Statistics for McLeod County*

County	Township/City	Year	Number of Jurisdictions Reporting	Total Acres	Total Estimated Value	Estimated Value Per Acre
McLeod	Acoma township	2005	1	17851	51060300	2860
McLeod	Bergen township	2005	1	21064	61281300	2909
McLeod	Biscay city	2005	1	0	0	
McLeod	Brownton city	2005	1	37	72500	1959
McLeod	Collins township	2005	1	19995	47314600	2366
McLeod	Glencoe city	2005	1	127	519100	4087
McLeod	Glencoe township	2005	1	20326	47867300	2355
McLeod	Hale township	2005	1	20508	58923900	2873
McLeod	Hassan Valley township	2005	1	19883	47696600	2399
McLeod	Helen township	2005	1	20937	62918000	3005
McLeod	Hutchinson city	2005	1	749	2095700	2798
McLeod	Hutchinson township	2005	1	18646	55092100	2955
McLeod	Lester Prairie city	2005	1	45	125300	2784
McLeod	Lynn township	2005	1	21198	49061350	2314
McLeod	Plato city	2005	1	64	292700	4573
McLeod	Rich Valley township	2005	1	21700	51898700	2392
McLeod	Round Grove township	2005	1	22100	51854500	2346
McLeod	Silver Lake city	2005	1	8	20900	2612
McLeod	Stewart city	2005	1	252	735700	2919
McLeod	Sumter township	2005	1	20958	48414700	2310
McLeod	Winsted city	2005	1	240	672300	2801
McLeod	Winsted township	2005	1	19823	59147600	2984

*Source: Minnesota Land Economics Database (http://www.cffm.umn.edu/landeconomics/landdata/LandValue)

Table 2. Soil types in McLeod County matched with productivity ratings (shaded soil types are on rented property)*

Co.	Soil Map Unit Code	Soil Map Unit Name	Acres in County	Productivity Rating
McLeod	1030	UDORTHENTS-PITS – GRAVEL COMPLEX	975	
McLeod	1075	KLOSSNER-MUSKEGO COMPLEX – PONDED	12707	
McLeod	1080	KLOSSNER-OKOBOJI-GLENCOE COMPLEX – PONDED	6299	
McLeod	CW	CENSUS WATER	10500	
McLeod	1834	COLAND CLAY LOAM – FREQUENTLY FLOODED	5740	5
McLeod	362	MILLINGTON LOAM – FREQUENTLY FLOODED	550	5
McLeod	1084	HANLON-KALMARVILLE COMPLEX – FREQUENTLY FLOODED	815	5
McLeod	1095	ZOOK SILTY CLAY LOAM – FREQUENTLY FLOODED	385	5
McLeod	1016	UDORTHENTS – LOAMY	460	5
McLeod	960F	STORDEN-CLARION COMPLEX – 18 TO 40 PERCENT SLOPES	305	10
McLeod	611C	HAWICK COARSE SANDY LOAM – 4 TO 12 PERCENT SLOPES	270	12
McLeod	920D2	CLARION-STORDEN-ESTHERVILLE COMPLEX – 12 TO 18 PERCENT SLOPES – ERODED	240	15
McLeod	960D2	STORDEN-CLARION COMPLEX – 12 TO 18 PERCENT SLOPES - ERODED	2110	20
McLeod	41B	ESTHERVILLE LOAM – 2 TO 6 PERCENT SLOPES	2800	30
McLeod	41A	ESTHERVILLE LOAM – 0 TO 2 PERCENT SLOPES	4210	33
McLeod	247	LINDER LOAM	585	35
McLeod	327B	DICKMAN SANDY LOAM – 1 TO 6 PERCENT SLOPES	240	35
McLeod	1091	KLOSSNER – SANDY SUBSTRATUM-HARPS-MAYER COMPLEX	980	40
McLeod	39B	WADENA LOAM – 2 TO 6 PERCENT SLOPES	290	43
McLeod	1213C	COKATO-STORDEN COMPLEX – 6 TO 12 PERCENT SLOPES - ERODED	800	45

McLeod	517	SHANDEP CLAY LOAM	430	45
McLeod	525	MUSKEGO MUCK	7653	46
McLeod	35	BLUE EARTH MUCKY SILTY CLAY LOAM	608	47
McLeod	39A	WADENA LOAM – 0 TO 2 PERCENT SLOPES	275	48
McLeod	1833	COLAND CLAY LOAM – OCCASIONALLY FLOODED	1035	48
McLeod	1229B	COKATO-STORDEN-ESTHERVILLE COMPLEX – 2 TO 6 PERCENT SLOPES	270	50
McLeod	27B	DICKINSON FINE SANDY LOAM – 1 TO 6 PERCENT SLOPES	330	50
McLeod	269	MILLINGTON CLAY LOAM – OCCASIONALLY FLOODED	270	50
McLeod	539	KLOSSNER MUCK	8066	50
McLeod	920C2	CLARION-STORDEN-ESTHERVILLE COMPLEX – 6 TO 12 PERCENT SLOPES – ERODED	1600	50
McLeod	945C2	LESTER-STORDEN COMPLEX - 6 TO 12 PERCENT SLOPES - ERODED	10530	52
McLeod	920B	CLARION-ESTHERVILLE COMPLEX – 2 TO 6 PERCENT SLOPES	835	55
McLeod	386	OKOBOJI MUCKY SILTY CLAY LOAM	575	55
McLeod	313	SPILLVILLE LOAM – OCCASIONALLY FLOODED	255	55
McLeod	1213B	COKATO-STORDEN COMPLEX – 2 TO 6 PERCENT SLOPES	2300	56
McLeod	944B	LESTER-STORDEN-ESTHERVILLE COMPLEX - 2 TO 6 PERCENT SLOPES	770	56
McLeod	392	BISCAY CLAY LOAM	5005	56
McLeod	112	HARPS CLAY LOAM	7300	57
McLeod	255	MAYER LOAM	4420	57
McLeod	1092	HARPS-GLENCOE COMPLEX	22200	58
McLeod	921C2	CLARION-STORDEN COMPLEX - 6 TO 12 PERCENT SLOPES – ERODED	6620	60
McLeod	414	HAMEL LOAM	2505	60
McLeod	114	GLENCOE CLAY LOAM	5157	60
McLeod	134	OKOBOJI SILTY CLAY LOAM	525	60
McLeod	978	CORDOVA-ROLFE COMPLEX	3700	62
McLeod	238B	KILKENNY CLAY LOAM – 2 TO 6 PERCENT SLOPES	240	63
McLeod	1193	COSMOS SILTY CLAY	80	65
McLeod	945B	LESTER-STORDEN COMPLEX – 2 TO 6 PERCENT SLOPES	10150	65
McLeod	956	CANISTEO-GLENCOE COMPLEX	66677	65*
McLeod	86	CANISTEO CLAY LOAM	2800	66McLeod
	109	CORDOVA CLAY LOAM	8665	70
McLeod	1159B	STROUT-ARKTON COMPLEX – 2 TO 6 PERCENT SLOPES	60	72
McLeod	1228	HOOPESTON-LE SUEUR COMPLEX	375	75
McLeod	887B	CLARION-SWANLAKE COMPLEX – 2 TO 6 PERCENT SLOPES	14720	75
McLeod	1901B	LESTER-LE SUEUR COMPLEX – 1 TO 6 PERCENT SLOPES	1448	75
McLeod	106B	LESTER LOAM – 2 TO 6 PERCENT SLOPES	14070	76
McLeod	113	WEBSTER CLAY LOAM	3680	77
McLeod	1204B	COKATO LOAM – 2 TO 6 PERCENT SLOPES	6400	78
McLeod	336	DELFT CLAY LOAM	505	80
McLeod	239	LE SUEUR LOAM	4715	80
McLeod	102B	CLARION LOAM – 2 TO 6 PERCENT SLOPES	13690	80
McLeod	1207B	COKATO-LE SUEUR COMPLEX – 1 TO 6 PERCENT SLOPES	700	80
McLeod	118	CRIPPIN LOAM	2060	82
McLeod	94B	TERRIL LOAM – 2 TO 6 PERCENT SLOPES	295	82
McLeod	130	NICOLLET CLAY LOAM	27675	88

*Information downloaded from website of Steve Taft of University of Minnesota in Fall 2005, now no longer available because Crop Equivalency Ratings are in the process of being revised.

Table 3. Minnesota Cropland Rental Rates Per Acre*

Area/County	Average								2004					
	96	97	98	99	00	01	02	03	10th Pctile	Avg	Median	90th Pctile	05	06
Central														
Benton	30	27	33	27	34	44	38	43	23	43	35	60	46	48
Kandiyohi	76	79	63	104	89	85	86	90	56	96	85	122	97	100
McLeod	78	84	98	97	84	95	93	100	63	96	95	120	101	102
Meeker	66	76	67	76	75	80	79	79	45	80	67	96	83	84
Morrison	20	23	25	27	29	29	30	32	16	31	27	44	34	35
Renville	94	103	101	110	103	109	112	106	73	104	99	126	111	112
Scott	95	95	107	108	103	106	112	114	67	112	94	126	116	119
Sibley	95	105	105	107	109	106	113	111	89	115	114	127	117	119
Stearns	40	49	50	53	52	51	55	64	29	67	40	84	67	70
Wright	55	62	59	68	73	71	69	72	47	72	73	95	77	79
South Central														
Blue Earth	97	100	107	103	110	105	109	115	80	118	117	132	119	121
Brown	93	98	99	105	100	102	105	102	82	108	104	125	108	109
Faribault	96	103	103	104	106	105	108	114	88	115	110	133	116	117
Freeborn	88	91	105	104	106	104	110	116	72	117	115	136	121	124
Le Sueur	94	91	96	96	96	97	96	100	78	100	102	121	100	101
Martin	102	106	106	105	106	106	108	110	92	114	114	131	112	114
Nicollet	97	106	105	104	104	110	105	111	81	108	107	145	111	112
Rice	90	95	98	101	99	101	101	104	75	106	101	129	107	108
Steele	91	95	101	108	103	111	108	112	79	118	116	136	120	123
Waseca	91	96	94	92	95	98	110	105	74	106	104	130	109	111
Watonwan	96	98	97	97	97	95	93	96	78	101	100	124	97	97

*Source: Hachfeld, G., Lazarus, W., Nordquist, D. and Loppnow, R. Cropland Rental Rates for Minnesota Counties. University of Minnesota Extension. Published September 2005. (http://www.cffm.umn.edu/landeconomics/landdata/FarmLandSale/Default.htm)